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10/577,520

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Qingjian Song

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INTEL/BSTZ

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EXAMINER

KRAFT, SHIH-WEI

ART UNIT

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2194

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/577,520	<b>Applicant(s)</b> SONG ET AL.	
	<b>Examiner</b> SHIH-WEI KRAFT	<b>Art Unit</b> 2194	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 April 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>12/13/2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

1. The instant application having Application No. 10/577,520 filed on 4/27/2006 is presented for examination by the examiner.

***Examiner Notes***

2. Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

**Oath/Declaration**

3. The applicant's oath/declaration has been reviewed by the examiner and is found to conform to the requirements prescribed in 37 C.F.R. 1.63.

**Priority**

4. As required by M.P.E.P. 201.14(c), acknowledgement is made of applicant's claim for priority based on applications filed on December 30, 2005 (PCT/CN2005/002416).

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

**Drawings**

5. The applicant's drawings submitted are acceptable for examination purposes.

**Information Disclosure Statement**

6. As required by M.P.E.P. 609, the applicant's submissions of the Information Disclosure Statement dated 12/13/2006 is acknowledged by the examiner and the cited references have been considered in the examination of the claims now pending.

**Claim Objections**

1. Claim 14 is objected to because of the following informalities:

Claim 14 recites "the support virtual events" in line 3. This appears to be a typographical error, and therefore, the Examiner interprets "the support virtual events" to refer to "the supported virtual events" of claim 10, line 10.

Appropriate correction is required.

**Claim Rejections - 35 USC § 101**

7. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-9 and 16-22 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 1 is rejected under 35 U.S.C. 101 as directed to non-statutory subject matter.

Claims that claim a series of steps or acts that are not tied to a particular machine or apparatus, or particularly transform a particular article to a different state or thing are not statutory within the meaning of 35 U.S.C. 101. In this instant case, the claim's recital of "providing", "interrupting", "storing", and "analyzing" are not tied to a particular machine or apparatus nor do they

particularly transform a particular article to a different state or thing. Absent such a requirement, the claim is not statutory.

Claims 2-9 are rejected under 35 U.S.C. 101 as non-statutory for at least the reason stated above. Claims 2-9 are dependent on claim 1, however, they do not add any feature or subject matter that would solve any of the non-statutory deficiencies of claim 1.

Claim 16 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. In light of the specification (see paragraph [0010]-[0011] of the specification), the claimed “machine-readable medium” includes carrier waves or signals (“transmission”) which are non-statutory subject matters. Applicant is suggested to insert – “non-transitory” – before “machine-readable medium” to obviate this rejection.

Claims 17-22 are rejected under 35 U.S.C. 101 as non-statutory for at least the reason stated above. Claims 17-22 are depended on claim 16, however, they do not add any feature or subject matter that would solve any of the non-statutory deficiencies of claim 16.

**Claim Rejections - 35 USC § 102**

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-3, 7, 9-11, 15-18, and 21-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Wang, et al. (US 2003/0004974) (hereinafter Wang).

As per claim 1, Wang discloses a method for an event analyzer (see ¶17, ¶35-36) comprising:

providing a plurality of virtual events supported by a platform for selection, wherein the virtual events are generated by a plurality of platform components; (e.g., “platform events”, see ¶24)

interrupting execution of an instruction at a time a selected virtual event occurs; (see ¶28, ¶34, ¶46)

storing the interrupted instruction; and (see ¶29)

analyzing the selected virtual event (see ¶25-26, Wang discloses “Software-based region selection and optimization allows the implementation of more sophisticated optimizations that cannot be easily accomplished in a conventional hardware-based dynamic optimizer.” Analysis of the monitored/collected events is necessarily required to make determinations upon how to optimize software-based regions.).

As per claim 2, Wang discloses the method of claim 1 [see rejection to claim 1] further comprising: providing a driver interface to associate with each of the platform components, (see ¶26-27) wherein the driver interface supplies a definition of the virtual events generated by the associated platform component (see ¶26-27).

As per claim 3, Wang discloses the method of claim 1 [see rejection to claim 1 above] further comprising: allocating a sampling buffer for the platform component generating the selected virtual event to store the interrupted instruction (see ¶27-28).

As per claim 7, Wang discloses the method of claim 1 [see rejection to claim 1] further comprising: assigning an interrupt vector to the selected virtual event, (e.g., “handler routine through a lightweight interrupt mechanism”, see ¶27, ¶34, ¶46) wherein the interrupt vector is accessed at a time the selected virtual event occurs (see ¶27, ¶34, ¶46).

As per claim 9, Wang discloses the method of claim 1 [see rejection to claim 1 above] wherein storing the interrupted instruction further comprises: storing information of an instruction module containing the interrupted instruction (see ¶29).

As per claim 10, Wang discloses a system of an event analyzer (see ¶35-36) comprising:  
a processor to execute instructions; (see ¶35-36)  
a plurality of platform components sharing a platform with the processor; (see ¶24, ¶35-36)

a plurality of virtual event provider drivers, each of the virtual event provider drivers being associated with one of the platform components to provide definitions for virtual events supported by the associated platform component; and (see ¶26-27)

a virtual event provider manager (e.g., “dynamic optimizer”, see ¶25) to query the virtual event provider drivers about the supported virtual events, wherein the virtual event provider manager causes selected virtual events to be analyzed (see ¶25-26, ¶35-36).

As per claim 11, Wang discloses the system of claim 10 [see rejection to claim 10 above] further comprising: a plurality of sampling buffers, each of the sampling buffers being assigned to each of the platform components that generate the selected virtual events, the sampling buffers storing the instructions being interrupted at a time the selected virtual events occur (see ¶27-28).

As per claim 15, Wang discloses the system of claim 10 [see rejection to claim 10 above] wherein the virtual event provider drivers respond to the query by sending an event identifier and an interrupt vector for each of the supported virtual events (see ¶39-40).

As per claim 16, Wang discloses a machine-readable medium (see ¶22, Wang discloses a “processor or computer”, which necessarily requires a medium having instructions to implement the monitoring and dynamic optimization approaches.) having instructions therein which when executed cause a machine to:

provide a plurality of virtual events supported by a platform for selection, wherein the virtual events are generated by a plurality of platform components; (e.g., “platform events”, see ¶24)

interrupt execution of an instruction at a time a selected virtual event occurs; (see ¶28, ¶34, ¶46)

cause the interrupted instruction to be stored; and (see ¶29)

cause the selected virtual event to be analyzed (see ¶25-26, Wang discloses “Software-based region selection and optimization allows the implementation of more sophisticated optimizations that cannot be easily accomplished in a conventional hardware-based dynamic



optimizer.” Analysis of the monitored/collected events is necessarily required to make determinations upon how to optimize software-based regions.).

As per claim 17, Wang discloses the machine-readable medium of claim 16 [see rejection to claim 16 above] further comprising instructions operable to: allocate a sampling buffer for the platform component generating the selected virtual event to store the interrupted instruction (see ¶28).

As per claim 18, Wang discloses the machine-readable medium of claim 16 [see rejection to claim 16 above] wherein interrupting execution of an instruction further comprises instructions operable to: interrupt the execution at a pre-determined sampling rate (see ¶27).

As per claim 21, Wang discloses the machine-readable medium of claim 16 [see rejection to claim 16 above] further comprising instructions operable to: assign an interrupt vector (e.g., “handler routine through a lightweight interrupt mechanism”, see ¶27, ¶34, ¶46) to the selected virtual event, wherein the interrupt vector is accessed at a time the selected virtual event occurs (see ¶27, ¶34, ¶46).

As per claim 22, Wang discloses the machine-readable medium of claim 16 [see rejection to claim 16 above] wherein causing the interrupted instruction to be stored further comprises instructions operable to: store information of an instruction module containing the interrupted instruction (see ¶29).

**Claim Rejections - 35 USC § 103**

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 4, 5, 8, 12, 13, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang, et al. (US 2003/0004974) (hereinafter Wang) in view of O'Donnell (US 6,374,369).

As per claim 4, Wang discloses the method of claim 1 [see rejection to claim 1 above] but fails to disclose expressly further comprising: providing a user interface to receive a user definition of the virtual events.

However, O'Donnell discloses further comprising: providing a user interface to receive a user definition of the virtual events (e.g., "human readable output" or "viewer", see col. 8, line 58 - col. 9, line 10).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the platform events as described by Wang with the human readable output and viewer as taught by O'Donnell because it would provide for the purpose of facilitating analysis through well known and common techniques via graphical means such as pie charts, bar charts, or other types of graphics (see O'Donnell col. 8, line 58 - col. 9, line 10).

As per claim 5, Wang discloses the method of claim 1 [see rejection to claim 1 above] but fails to disclose expressly wherein analyzing the selected virtual event comprises: calculating a frequency of the selected virtual event occurring at a time an instruction module is executed.

However, O'Donnell discloses wherein analyzing the selected virtual event comprises: calculating a frequency of the selected virtual event occurring at a time an instruction module is executed (see col. 14, lines 4-37).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the platform events as described by Wang with the frequency or sampling ratio as taught by O'Donnell because it would provide for the purpose of facilitating analysis through well known and common techniques via graphical means such as pie charts, bar charts, or other types of graphics (see O'Donnell col. 8, line 58 - col. 9, line 10).

As per claim 8, Wang discloses the method of claim 1 [see rejection to claim 1 above] but fails to disclose expressly further comprising: reporting an analysis at a time the instruction execution reaches a user-specified time limit.

However, O'Donnell discloses further comprising: reporting an analysis at a time the instruction execution reaches a user-specified time limit (e.g., "timers", see col. 6, lines 21-25, 33-46, 64 – col. 7, line 8).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the platform events as described by Wang with the user selections and settings as taught by O'Donnell because it would provide for the purpose of facilitating analysis of routines

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and/or variables that are of interest in profiling software (see O'Donnell col. 6, line 64 – col. 7, line 8).

As per claim 12, Wang discloses the system of claim 10 [see rejection to claim 10 above] but fails to disclose expressly the virtual event provider manager and virtual event provider drivers further comprise: a forwarding mechanism to forward user-specified configuration values to the platform components.

However, O'Donnell discloses the virtual event provider manager and virtual event provider drivers further comprise: a forwarding mechanism to forward user-specified configuration values to the platform components (see col. 6, line 61 - col. 7, line 16; col. 7, lines 32-54).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the platform events as described by Wang with the user selections and settings as taught by O'Donnell because it would provide for the purpose of facilitating analysis of routines and/or variables that are of interest in profiling software (see O'Donnell col. 6, line 64 – col. 7, line 8).

As per claim 13, Wang discloses the system of claim 10 [see rejection to claim 10 above] but fails to disclose expressly further comprising: a report generator to generate a report that allows a user to identify the interrupted instructions.

However, O'Donnell discloses further comprising: a report generator to generate a report that allows a user to identify the interrupted instructions (see e.g., "human readable output" or "viewer", see col. 8, line 58 - col. 9, line 10).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the platform events as described by Wang with the human readable output and viewer as taught by O'Donnell because it would provide for the purpose of facilitating analysis through well known and common techniques via graphical means such as pie charts, bar charts, or other types of graphics (see O'Donnell col. 8, line 58 - col. 9, line 10).

As per claim 19, Wang discloses the machine-readable medium of claim 16 [see rejection to claim 16 above] but fails to disclose expressly wherein causing the selected virtual event to be analyzed further comprises instructions operable to: calculate a frequency of the selected virtual event occurring at a time an instruction module is executed.

However, O'Donnell discloses wherein causing the selected virtual event to be analyzed further comprises instructions operable to: calculate a frequency of the selected virtual event occurring at a time an instruction module is executed (see col. 14, lines 4-37).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the platform events as described by Wang with the frequency or sampling ratio as taught by O'Donnell because it would provide for the purpose of facilitating analysis through well known and common techniques via graphical means such as pie charts, bar charts, or other types of graphics (see O'Donnell col. 8, line 58 - col. 9, line 10).

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12. Claims 6, 14, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang, et al. (US 2003/0004974) (hereinafter Wang) in view of Berry et al. (US 6,754,890).

As per claim 6, Wang discloses the method of claim 1 [see rejection to claim 1 above] but fails to disclose expressly wherein storing the interrupted instruction further comprises: time-stamping the interrupted instruction.

However, Berry discloses wherein storing the interrupted instruction further comprises: time-stamping the interrupted instruction (col. 15, lines 53-67).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the platform events as described by Wang with the timestamp as taught by Berry because it would provide for the purpose of obtaining other timing information that can be calculated from the timestamp (see Berry col. 14, lines 51-60).

As per claim 14, Wang discloses the system of claim 10 [see rejection to claim 10 above] but fails to disclose expressly further comprising: an event map table accessible by the virtual event provider manager to store a mapping between local indices of the support virtual events and platform-wide event identifiers.

However, Berry discloses further comprising: an event map table accessible by the virtual event provider manager to store a mapping between local indices of the support virtual events and platform-wide event identifiers (see Figure 23-24; see col 26, lines 46-65; col. 27, lines 11-32).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the platform events as described by Wang with the merging of trace records as taught by Berry because it would provide for the purpose of obtaining system-level information that were not collected within the trace record at the application level (see Berry col. 25, line 57 – col. 26, line 18).

As per claim 20, Wang discloses the machine-readable medium of claim 16 [see rejection to claim 16 above] but fails to disclose expressly wherein causing the interrupted instruction to be stored further comprises instructions operable to: time-stamp the stored interrupted instruction.

However, Berry discloses wherein causing the interrupted instruction to be stored further comprises instructions operable to: time-stamp the stored interrupted instruction (col. 15, lines 53-67).

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the platform events as described by Wang with the timestamp as taught by Berry because it would provide for the purpose of obtaining other timing information that can be calculated from the timestamp (see Berry col. 14, lines 51-60).

### **Conclusion**

13. The following prior art made of record and not relied upon is cited to establish the level of skill in the applicant's art and those arts considered reasonably pertinent to applicant's disclosure. See **MPEP 707.05(c)**.

14. The following reference teaches execution of trial data.

a. US 7,707,554 titled “Associating Data Source Information with Runtime Events” by Kosche et al. (hereinafter Kosche). Kosche discloses runtime events as events that occur during execution of code and causes execution hindrance. Data source information is associated with runtime events to allow identification of system components that causes the runtime events, and therefore, code can be optimized from the perspective of system components.

b. US 7,373,557 titled “Performance Monitor for Data Processing Systems” by Wise et al. (hereinafter Wise). Wise discloses a performance monitoring system that performs data capture and control to facilitate monitoring in real time. Furthermore, Wise discloses sampling of events after a certain instruction is performed by a data processing element.

c. US 7,249,288 titled “Method and Apparatus for Non-Intrusive Tracing” by Peled et al. (hereinafter Peled). Peled discloses counting selected events and obtaining information relating to events associated with the processor and to events of components other than the processor.

d. US 6,728,949 titled “Method and System for Periodic Trace Sampling Using a Mask to Qualify Trace Data” by Bryant et al. (hereinafter Bryant). Bryant discloses profiling based on qualifying flags at the request of a user. During a profiling phase, if an occurrence of an event or a timer interrupt is detected, a determination is made as to



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whether or not a trace record is generated based on the selection of trace qualifying conditions.

e. US 6,513,155 titled "Method and System for Merging Event-Based Data and Sampled Data into Postprocessed Trace Output" by Alexander, III et al. (hereinafter Alexander). Alexander discloses processing and collection of event-based trace data that includes an indication of which code is being interrupted. Trace records may originate from two types of profiling actions - event-based profiling and sample-based profiling. Alexander discloses that a trace file may have a combination of event-based records and sample-based records.

f. US 5,754,759 titled "Testing and Monitoring of Programmed Devices" by Clarke et al. (hereinafter Clarke). Clarke discloses detecting events by monitoring instruction fetches from memory and other bus activity. Simple profiling can be performed by combining non-intrusive interrupts with timing information to allow a programmer to optimize a section of code.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shih-Wei Kraft whose telephone number is (571) 270-3388. The examiner can normally be reached on Monday to Friday 6:30 AM to 3:30 PM.

If attempts to reach the above noted Examiner by telephone are unsuccessful, the Examiner's supervisor, Hyung Sough, can be reached at the following telephone number: (571) 272-6799.

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The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/H. S. SOUGH/  
Supervisory Patent Examiner, Art Unit 2194  
08/01/10

/S. K./  
Examiner, Art Unit 2194